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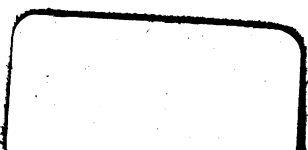
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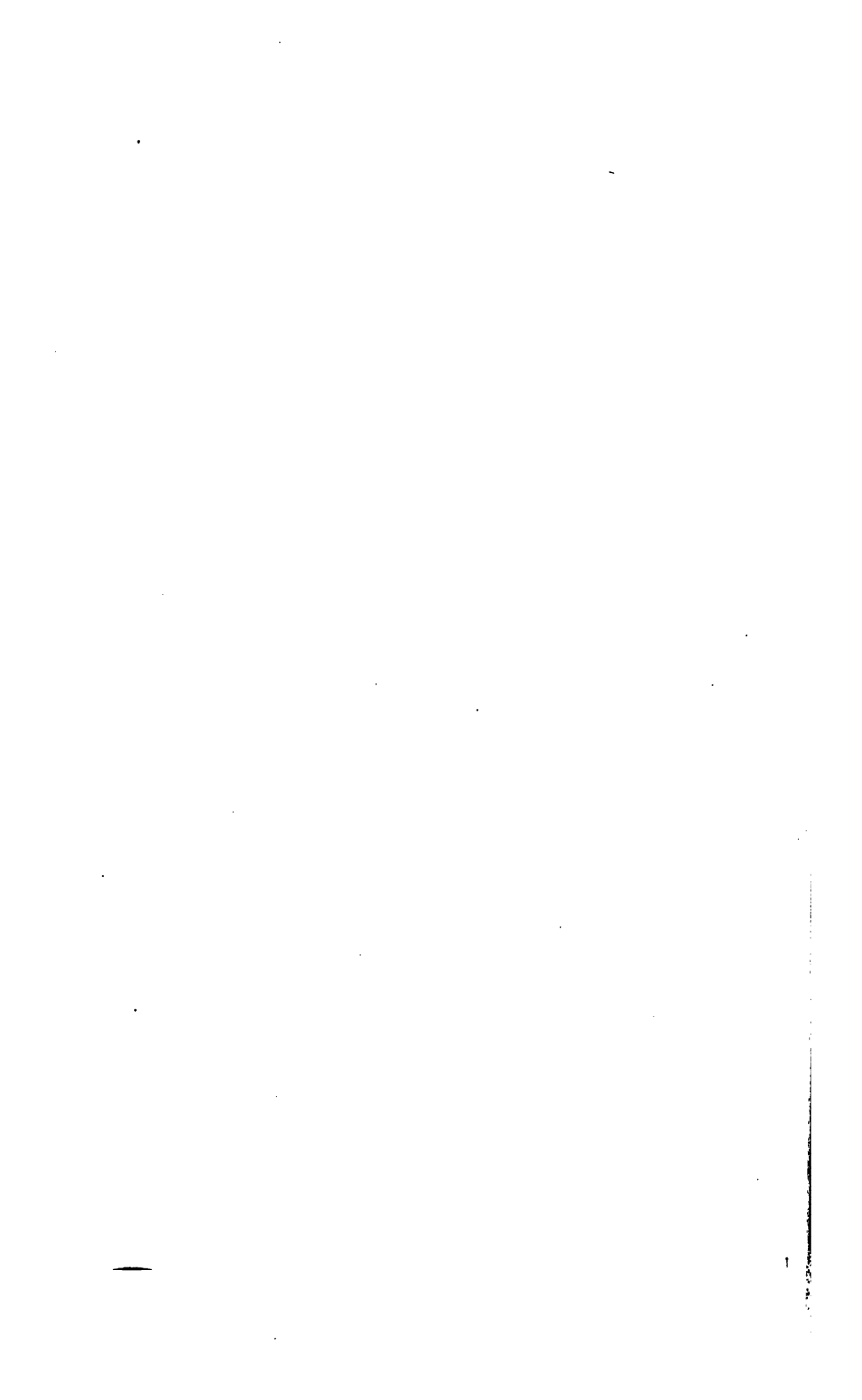
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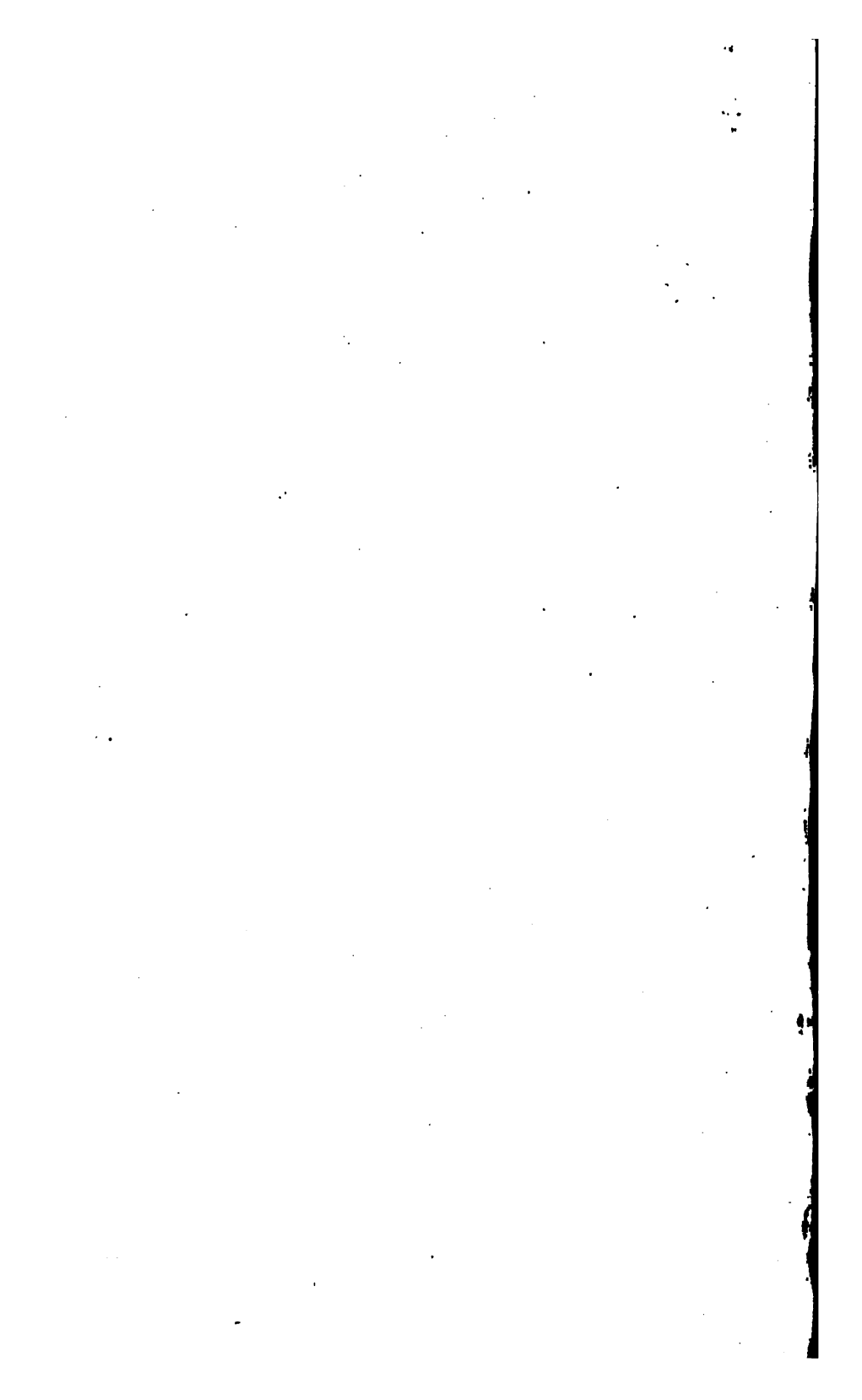


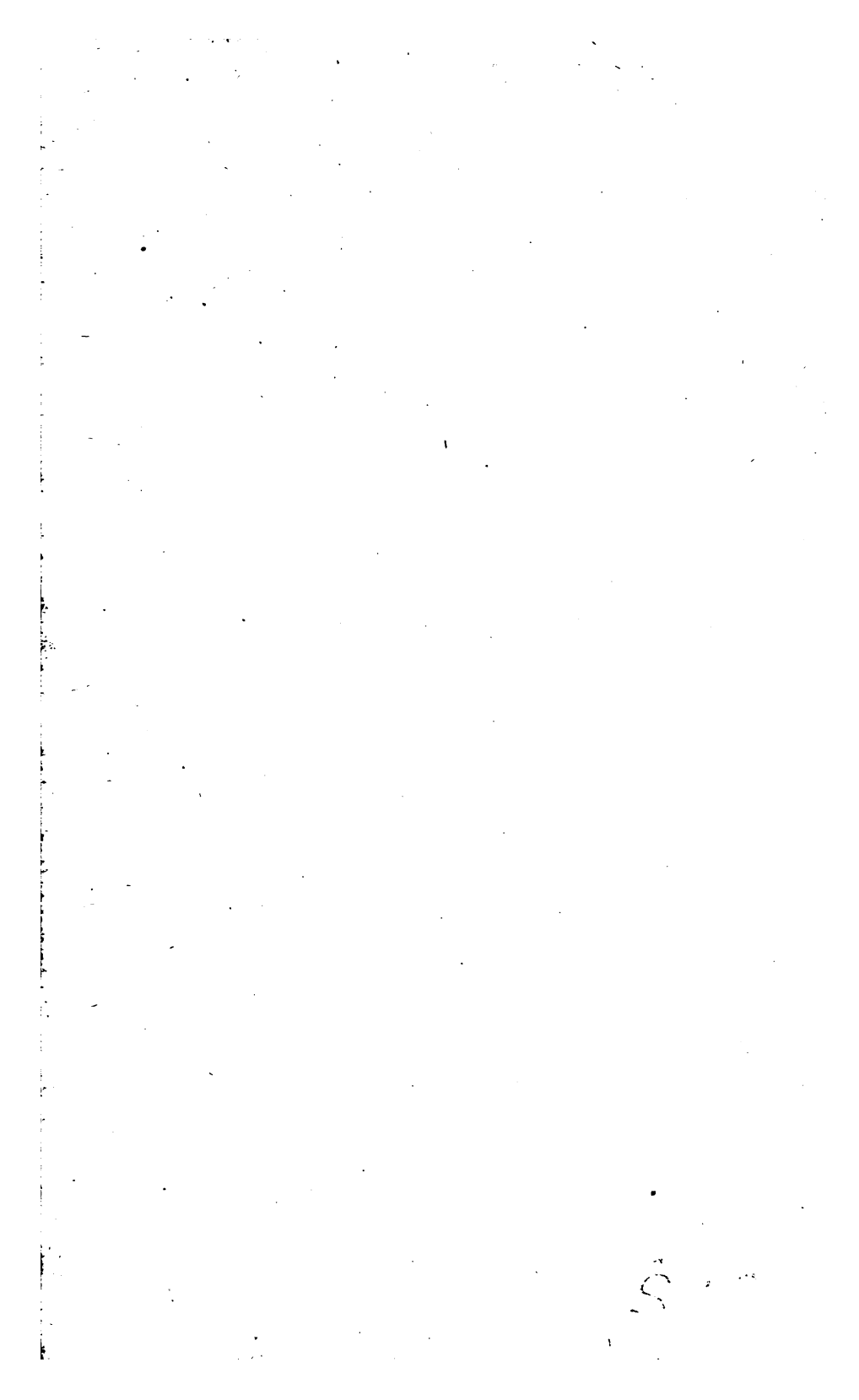
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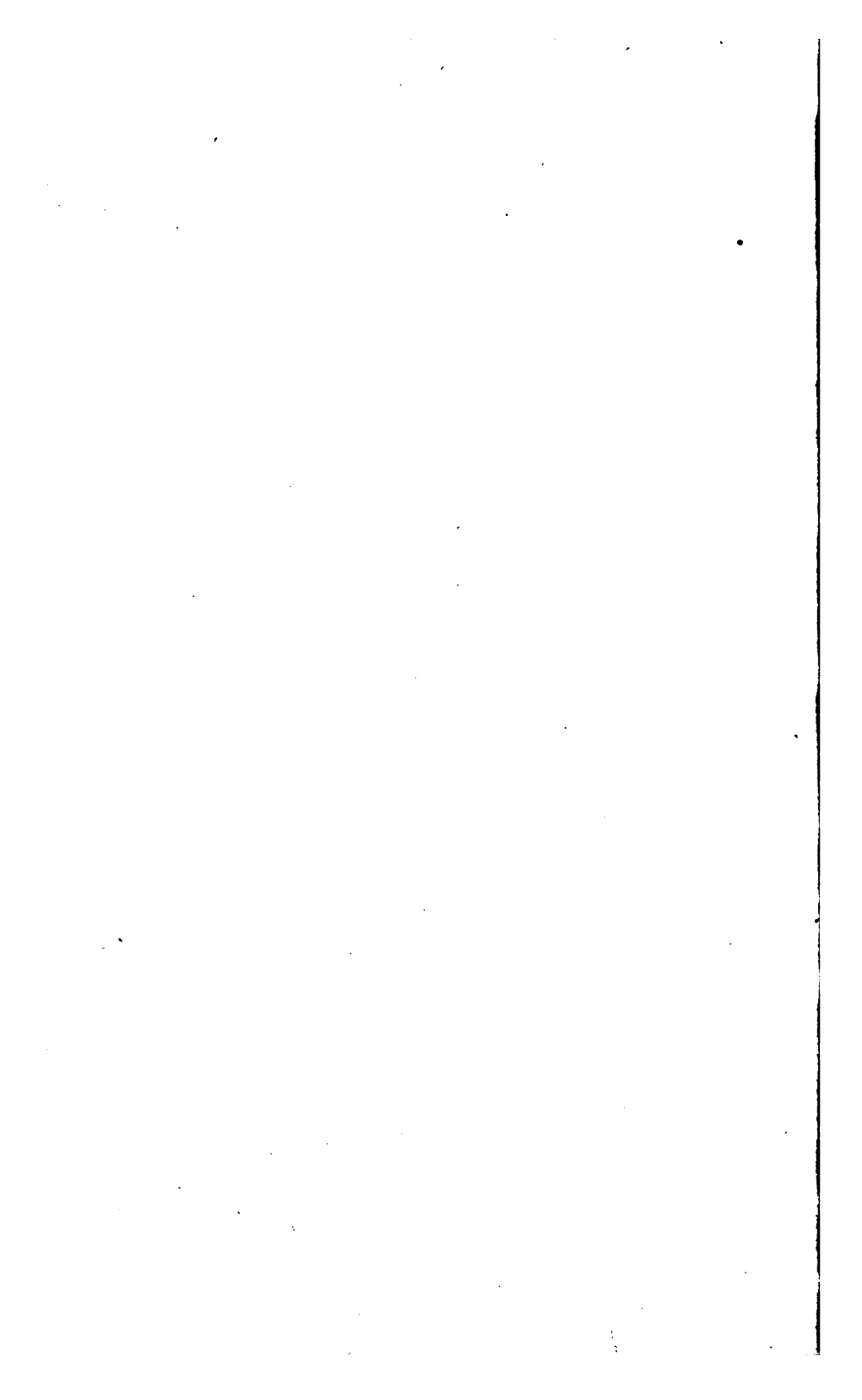
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THE
JOURNAL
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INSTITUTE OF ACTUARIES
AND
ASSURANCE MAGAZINE.

INDEX
TO THE
FIRST, TWENTY VOLUMES.

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PREFACE.

IN drawing up the following index to the first 20 volumes of the *Journal of the Institute of Actuaries and Assurance Magazine*, I have adopted the plan which my experience has led me to believe would be most useful to persons who wish to refer to any particular paper, or to ascertain what has been written upon any subject which they are at the time studying. With this view, I have laid down the general rule that every paper is to be indexed at least twice,—(1) under the author's name, and (2) under the subject.

Under the author's name are arranged in order of date all the communications from him, whether long or short, whether they appeared in the form of a paper, a short note, or a letter to the Editor; and in each case the exact title adopted by the author is given, some explanation being occasionally added when this seemed desirable, in order to indicate more clearly the nature of the subject dealt with in the communication. At the end of these communications are arranged any other entries that it appeared desirable to make under the author's name, such, for instance, as translations by him of foreign articles, reviews of works written by him, and, in the case of the two Editors, editorial remarks.

It has been a much more troublesome matter to arrange the articles according to the nature of the subject; and in doing this I have had to be guided principally by my own judgment, and to a comparatively small extent by the wording of the title of the paper. For instance, the numerous papers upon the subject of the graduation of life tables are arranged under the heading of "Graduation", although in the titles of some of them that word does not appear, the process being

called "Adjustment". Under the heading "Adjustment of Tables", I have given a cross reference to "Graduation". In cases of this kind, where references to many papers are collected under one heading, I have contented myself with giving the author's name and the volume and page of his article, leaving the reader to refer to the author's name in the index if he wishes for further particulars.

In many cases, references to a particular paper have been given under two or three different headings descriptive of the subject.

In addition to references of the kind just named, I have endeavoured to give under each paper references to subsequent papers by different authors in which the paper is mentioned or discussed. Although a great deal of time and trouble has been bestowed upon this part of the work, I can scarcely hope that it has been done with any approach to completeness; but I hope that what has been done will be found to be of material assistance to students and others consulting the index.

It may now be useful to mention some of the headings in the index under which the entries are most numerous.

BONUS (OR INVESTIGATION) REPORTS. Under this heading are placed the names of all the companies whose bonus or investigation reports have appeared in the *Journal* since 1867, when the plan was adopted of systematically printing these reports under the title of "Home and Foreign Intelligence". As I stated in the *Journal* (October 1867), I believe that such reports have for various reasons a permanent interest attaching to them; but since the Life Assurance Companies Act, 1870, has made it compulsory on all the life offices in the country to publish full particulars regarding their valuations and distributions of profits, which particulars are annually published by the Board of Trade in the form of a Blue-book, it has seemed undesirable to continue the practice of reprinting all such reports of British companies in the *Journal*; and, during recent years, only a few of more than usual interest have been reprinted, more particularly such as contained information not given in the Blue-books. I have, however, printed a considerable number of bonus reports of Australian offices, which are not so readily accessible as those of

British companies. The names of the companies in the index are arranged alphabetically under the above-mentioned heading, and I have considered it unnecessary to insert the name of the company a second time in its alphabetical place in the index.

CORRESPONDENCE (*anonymous*). Only those letters appear here to which the author's name was not appended. All letters which were signed by the author, have been entered, like other communications, under his name.

DISCUSSIONS. Under this heading are given references to the abridged reports of the discussions at the Meetings of the *Institute*, which have appeared in the *Journal* since 1869, and for which, as is well known, we are indebted to the public spirit of the proprietors of the *Insurance Record*. The full reports of the discussions given in that paper were, as they appeared, carefully revised and condensed, the persons who took part in the discussion being sometimes referred to for assistance when this was thought desirable; and although this involved a considerable expenditure of time and labour on the part of myself and the gentlemen who kindly assisted me, I believe that the time and labour were well bestowed, as the reports of the discussions have been found very useful for reference, and are generally appreciated by students of the *Journal*. The various discussions are arranged in the alphabetical order of the names of the authors whose papers were discussed.

FIRE INSURANCE. Here are inserted references to all the communications on the subject that have appeared in the *Journal*. A similar course has been followed as regards MARINE INSURANCE; but not with the corresponding heading LIFE INSURANCE, because the greatest part of the *Journal* is occupied with this subject. Instead of this, I have given the headings, ANNUITIES, ANNUITY- (*certain, continuous, increasing, &c., &c.*), ASSURANCE, PREMIUMS, VALUES OF POLICIES, and others of a like kind.

FOREIGN INTELLIGENCE. Under this general heading are entered all the numerous articles as to Fire and Life Insurance business in foreign countries, with the exception of the reports of companies, which are put under the general heading REPORTS OF COMPANIES—FOREIGN. The entries are divided under the sub-headings, *Life*

Insurance, Fire Insurance, Marine Insurance, Miscellaneous Branches of Insurance, General Articles; and again, under each of these, according to the names of the country to which they relate, *Austria, Belgium, France, &c.*

MORTALITY. The various articles relating to this subject have been arranged under the headings (1) *Mortality Experience of various Offices* (the names of Offices being placed alphabetically); (2) *Mortality, General Remarks*; (3) *Mortality Observations*, (being observations as to the rate of mortality in different countries and among different classes of persons); (4) *Mortality Tables, Construction of*.

ORIGINAL TABLES. A great number of original tables have been at various times contributed to the *Journal*; and as the use of these will be much facilitated by having a complete list of them in a convenient form, I have bestowed much pains in the description of them under the above general heading. I first give an alphabetical list of the names of the persons whose tables are printed in the *Journal*, with a reference to the volume and page. I then, in a second division, give an alphabetical list of the subjects to which the tables relate, adding the author's name and the volume and page. In a third division, arranged in chronological order, I have given, besides the author's name, a full description of each table, containing such particulars as I thought likely to be of service to persons using the index.

REPORTS OF COMPANIES. In the early volumes of the *Journal* it was usual to give summaries of the annual reports of Insurance Offices, both British and Foreign. References to all these summaries are entered under the above general heading with the three sub-headings—*British—Colonial and Indian—Foreign*, the last being subdivided under the names of the various countries. In each section the names of the companies are arranged alphabetically. As in the case of Bonus Reports, I have considered it unnecessary to enter the names of the companies again in their alphabetical place in the index.

REVIEWS. Under this heading are arranged in alphabetical order the names of all the authors whose works have been reviewed in the *Journal*, each being followed by the title of the book.

The task of preparing the index has been extremely laborious ; but I undertook it and persevered with it in spite of many hindrances which have greatly delayed the completion of the work, because I believed that it was very important it should be done by a person familiar with the subject, and that the value of the work to the profession and the student, would be thereby greatly increased. I trust that this opinion will be shared and confirmed by those who shall hereafter have occasion to consult the index ; and if so, I shall feel well rewarded for the labour and time the preparation of it has cost me.

T. B. SPRAGUE.

EDINBURGH,

28 *March* 1883.

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(2) An alphabetical list is given of the various subjects to which the Original Tables relate, with the author's name and a reference to the volume and page.

(3) In this division the entries are arranged in the order in which the tables appeared, and contain a full description of each table; so that a person who has obtained, by means of (1) or (2), a reference to the volume and page, will here find exact particulars of the table, and be able to ascertain whether it gives the information he requires, without being under the necessity of referring to the table itself.

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 „ 30*. W. T. Thomson.—Male Lives selected for Government Annuities. $\log p_x$, l_x , and e_x , for ages 76–97.
 „ 174. C. Jellicoe.—Bengal Military Mortality. 100 q_x , p_x , $\log p_x$, $\log l_x$, irregular and graduated; also l_x , D_x , N_x , a_x , and w_x ; (from Mr. Neison's data, at 4 per-cent). Also l_x , D_x , N_x , a_x , w_x , and office premiums; (from Mr. Woolhouse's data at 4 per-cent).
 „ 198. J. A. Higham. Select Lives, Seventeen Offices' Experience. "Mixed Mortality", p_x , e_x , a_x , at 3, 3½ per-cent; "Class Mortality", P_{x+t} , e_{x+t} , a_{x+t} , at 3 and 3½ per-cent, for $[x] = 25, 30, 35, \dots, 75$.
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 „ 318. D. Chisholm.—Probabilities of Survivorship between Two Lives, Carlisle 3 per-cent. $\log l_{x+t}$, and $\log D_{x+t} (= \log l_{x+t}^{v^{x+1}})$, $\log l_{xy}$, $\log D_{xy}$, $\log d_{x|y+t}$, $d_{x|y+t}$, $\log d_{x|y+t}$, $\log d_{x|y+t}$, $\log Q_{xy}$, Q_{xy} , $\log C_{xy}$, C_{xy} , M_{xy} , R_{xy} , $\log M_{xy}$, $\log A_{xy}$, D_{xy} , N_{xy} .
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 „ 89. D. Chisholm.—Instant of Death—Carlisle 3 per-cent \bar{C}_x , \bar{M}_x , \bar{A}_x and \bar{w}_x , according to the formulas—
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 „ 210. C. Jellicoe.—Eagle Experience. 100 q_x , e_x , Males, p. 210; Females, p. 212; 100 q_x , l_x , d_x , e_x , Combined Males and Females unadjusted, p. 214; 100 q_x , l_x , d_x , e_x , and a_x , and w_x , at 4 per-cent, ditto adjusted, p. 214.
 „ 383. P. Hardy.—Value of Annuities-certain for any number of years not exceeding 100, at the rates of interest $1\frac{1}{2}$, $1\frac{3}{4}$, $1\frac{1}{2}$, $1\frac{1}{4}$, $2\frac{1}{4}$, $2\frac{3}{4}$, $2\frac{1}{2}$ per-cent.
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 „ 363. W. Braid.—Carlisle 3 per-cent. 100 A_{xy} and 100 w_{xy} , for $x = 15, \dots, 60$, and $y = 15, \dots, 60$.
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- „ 181. C. A. M. Willich.—Hypothetical Carlisle Table. e_x by the formulas— $\frac{1}{2}(81\frac{1}{2}-x)$ for values of x from 5 to 60; $\frac{1}{2}(88\frac{1}{2}-x)$ for $x=61$ to 74; and $\frac{1}{2}(103-x)$ for $x=75$ to 90.
- viii, 18. T. B. Sprague.—Value of a Life Interest to allow the purchaser 5 per-cent on the outlay, according to the formula $\frac{1}{\omega + \cdot 047619} - 1$, for values of ω , .015, .0155, .016, 080.
- „ 133. A. Day.—Premiums for Insurances against Issue. Probability of marrying in a year, Bachelors and Widowers of the general population (1851). Present value of £1 payable at the end of the year in which a husband shall contract a second marriage, English 3 per-cent Table.
- „ 139. C. A. M. Willich.—Hypothetical English (No. 1) Table, Males. $e_x = \frac{1}{2}(80-x)$ for values of x from 5 to 60.
- „ 173. S. L. Laundy.—English Table No. 1. $N_{x|n}$, $S_{x|n}$, $M_{x|n}$, $R_{x|n}$, at 3 per-cent ($x+n=60$).
- ix, 204. Healthy Districts Table by W. Farr; λl_x , l_x , d_x , L_x , P_x , Q_x , Y_x , e_x , $x+e_x$.
- „ 223. R. Campbell.—Table of $\log \frac{b+x}{b}$ or $\frac{b}{b-x}$, for all values of b from 1 to 20, and x from 1 to 20. Also probability that deviations from an average will exceed a named percentage, p. 232.
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- „ 365. W. M. Makeham.—Carlisle Table, adjusted. l_x , d_x , e_x .
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- „ 78. W. Spens, Select Lives, *Scottish Amicable* Experience. $q_{[x]}$, $q_{[x]+1}$, $q_{[x]+2}$, $q_{[x]+3}$, $q_{[x]+4}$, $q_{[x]+5}$; $a_{[x]}$ at 4 per-cent.
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- „ 263. W. D. Biden.—Value of a Life Annuity to allow the purchaser a net interest of 5 per-cent, $\frac{1}{\omega + \cdot 047619} - 1$; value of the annuity when secured by the policy, $\frac{\cdot 952381}{\omega + \cdot 047619}$; annuity covered by every £1 assured, $\omega + \cdot 047619$; for premiums per-cent, £1, £1. 0s. 3d., £1. 0s. 6d., £1. 0s. 9d., £2; £2. 0s. 6d., £2. 1s., £6; £6. 1s., £6. 2s., £9. 14s.; £9. 16s., £9. 18s., £10.
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- „ 74. W. S. B. Woolhouse.—Tables to facilitate Interpolation, for intervals 5 and 10.
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- „ 324. W. S. B. Woolhouse.—Force of mortality, μ_x , Experience, Carlisle, and Davies's Equitable Tables.
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- xii, 225. G. W. Berridge.—Peerage Males. $p_x, l_x, d_x, e_x; D_x, N_x, a_x$, and w_x , at 3 per-cent.
- „ 235. W. Morgan.—Equitable Experience (Table A). $D_x, N_x, S_x, M_x, R_x, a_x, A_x$, and w_x , at 3 per-cent.
- xiii, 344. W. M. Makeham.—Adjusted Mortality Table, Finlaison's Males of Friendly Societies. l_x, d_x, q_x, e_x .
- xiv, 265. H. W. Manly.—Values of Policies by various Tables of Mortality and methods of valuation, namely, Carlisle, Seventeen Offices, English (No. 3) Males, English (No. 2) Males, Davies's Equitable, Edmonds's Mean Mortality, J. Finlaison's Government Annuity Males, Northampton, and Hypothetical Tables, at 3, $3\frac{1}{2}$, and 4 per-cent.
- „ 432. T. B. Sprague.—Life Annuities, Immediate and Reversionary. (1) Policy and Redemption Money, when a life annuity of 1 is purchased, allowing for insurance at an average rate, and returning the purchaser 5 and 6 per-cent, respectively, on his outlay; $\text{Policy} = \frac{1}{w+d}$, $\text{Redemption Money} = \frac{1-d}{w+d}$; (2) Values of Reversionary Annuity, as found by Mr. Jellicoe's formula, $\frac{1}{P+d_5} - a_{x|5}$, and by Mr. Sprague's, $\frac{1}{P+d_5} - \frac{1}{2} - \left(1 - \frac{d_5}{2}\right)a_{x|5}$, and $\frac{1}{P+d_5} - \frac{1}{2} - a_{x|5}\left(\frac{P+d_5}{P+d_5} - \frac{d_5}{2}\right)$; (3) Annuity which 1 will purchase, and its redemption money, by the same three formulas.
- xv, 125. W. S. B. Woolhouse.—Northampton Table. $\log \mu_x, \mu_x$; and \bar{a}_x at 3 per-cent. Also δ and $\log \delta$ at rates of interest $\frac{1}{4}, 1, 1\frac{1}{2}, 2, \dots \dots \dots 10$. per-cent.
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- „ 437. W. M. Makeham.—Table for determining the amounts, &c., of Continuous Annuities—certain; $\log \frac{e^x - 1}{x}$ for values of x , .00, .01, 02, 10.40.
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- „ 206. S. Brown.—Indian Military Officers and Civil Servants, during service and after retirement, and their wives, widows, and children. Forces of mortality and marriage, $\log q_x, q_x, p_x, \log p_x, \log l_x, l_x, d_x$.
- „ 413. W. M. Makeham.—Sickness and Invalidism (A. G. Finlaison's Data). Tables showing the numbers of sick and healthy among l_x persons of age x ; also the number invalided between ages x and $x+1$, the number of recoveries, &c.
- „ 429. S. Brown.—Institute HMF Table, adjusted by Mr. Makeham's formula. $l_x, d_x, q_x; D_x, N_x, M_x, a_x, a_{xx}$, at 3 and 4 per-cent.
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- „ 335. W. A. Bowser. Hodgson's Clergy Mortality adjusted. $l_x, d_x, q_x; a_x$ and A_x at 3 and 5 per-cent; w_x at 3 per-cent.
- xviii, 167. A. J. Finlaison.—India—Uncovenanted Service Family Pension Fund. $l_x, d_x, \log l_x, \log p_x, p_x, q_x$.
- „ 184. G. Humphreys. *Eagle* Unsold Lives. l_x, q_x, d_x, e_x .

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- „ 373. H. A. Smith.—Indian Military Lives and Civil Lives (S. Brown's Data). a_x and w_x , at 3 per-cent.
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- „ 398. G. King.—Analyzed Mortality. $l_{[x]+n}$, $d_{[x]+n}$, $p_{[x]+n}$, $q_{[x]+n}$, for $x=20, 25, 30, \dots, 65$.
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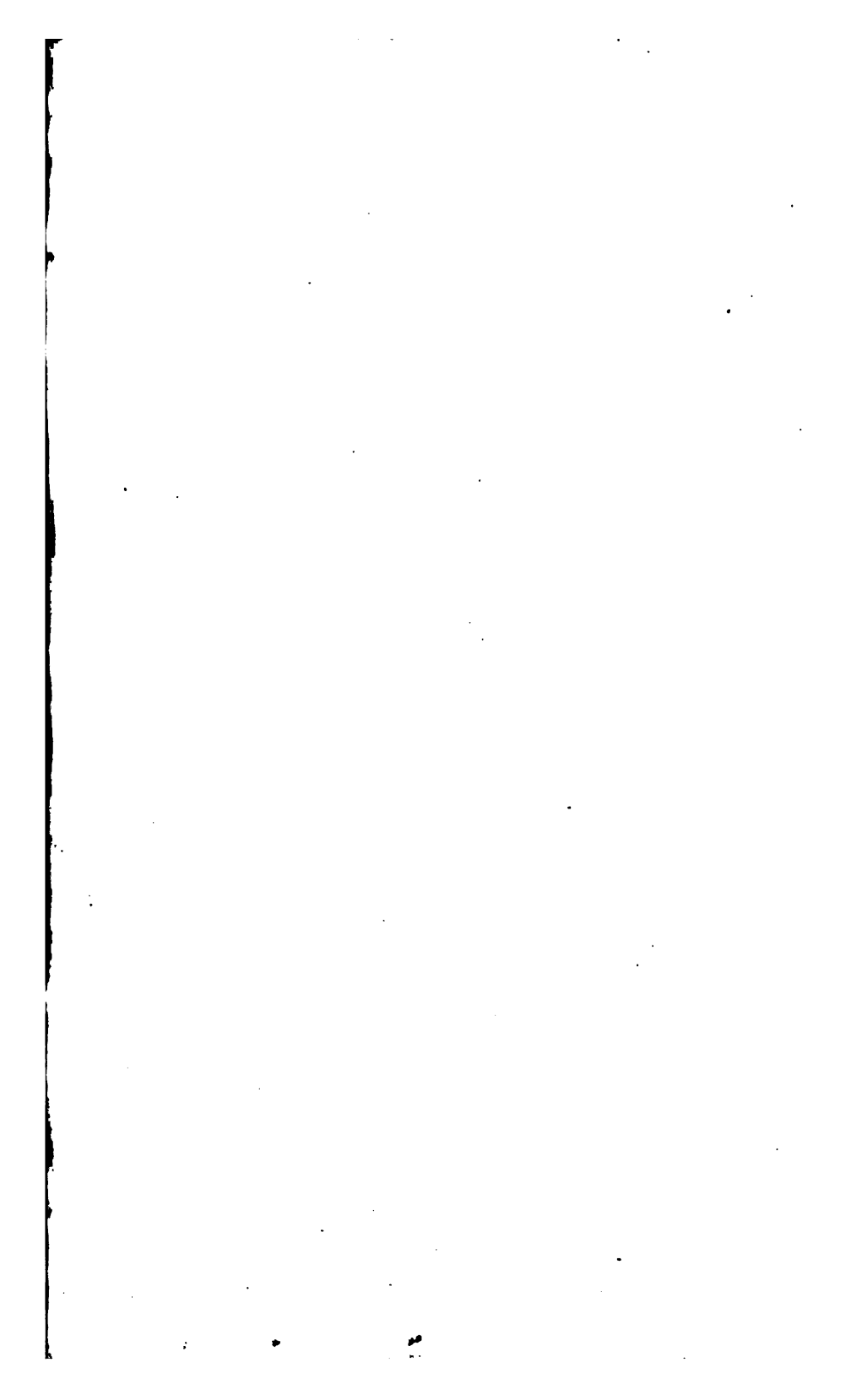
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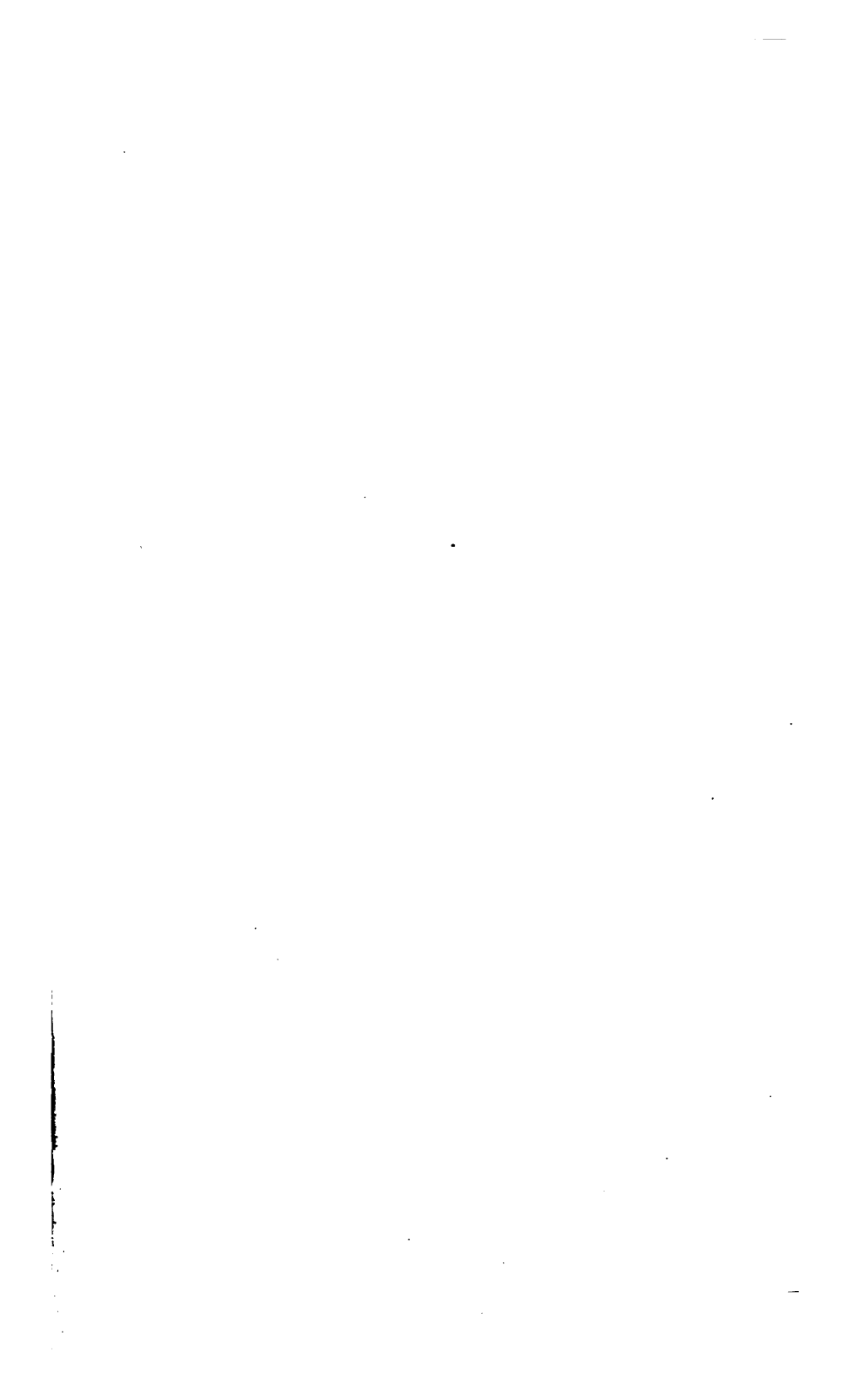
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